AERIAL SCOTER AND SCAUP MONITORING SURVEY

OF THE YUKON FLATS,

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Abstract: The second annual aerial survey to monitor scoter populations on the Yukon Flats, Alaska was conducted on 9-12 June 2002. The primary survey area consisted of four strata with a total of 58 transects. White-winged scoters and surf scoters accounted for 99.0 and 1.0% of the indicated-total scoters observed during the survey, respectively. No black scoters were observed on the survey. The monitoring indices for white-winged scoters, surf scoters, and black scoters were 16,951, 165, and 0 respectively. The index for white-winged scoters increased 3% from the previous year. The index for lesser scaup was 23,745.

Key Words: aerial survey, Alaska, Yukon Flats, white-winged scoter, surf scoter, scaup, monitoring **April 2003**

INTRODUCTION

Scoters are among the least studied of North American waterfowl and little is known of their life history, ecology, and distribution (USFWS 1999). Furthermore, existing monitoring surveys such as the Alaska-Yukon Waterfowl Breeding Population Survey (AYWBPS, Conant and Groves 2001) are not temporally designed to monitor scoters which are among the latest migrants to arrive on their breeding grounds (Lensink 1965). Although the AYWBPS was not designed to monitor scoters, data from that survey indicate a substantial population decline across Alaska with a gradual decline occurring in interior Alaska (Conant and Groves 2001).

The Yukon Flats supports the highest densities of scoters and lesser scaup *(Aythya affinis)* in interior Alaska (Lensink 1965, King and Lensink 1971, Bellrose 1980). Furthermore, scoters and scaup are among the latest waterfowl to commence nesting on the Yukon Flats (Lensink 1965). Due to the late arrival of scoters and late nesting by scoters and scaup, traditional monitoring efforts for these divers are not optimally timed.

This survey was initiated in 2001(Mallek 2002[a]) to provide monitoring data primarily for white-winged scoters (*Melanitta fusca)* that breed in the Yukon Flats. Due to the late nesting efforts by scoters, as well as scaup, scaup were added to this monitoring survey in 2002. This report summarizes the results of the 2002 scoter and scaup monitoring survey of the Yukon Flats, Alaska.

STUDY AREA AND METHODS

Study Area and Survey Design

The core survey area (9,728.3 km^2) included 58 transects systematically located in four strata within the Yukon Flats where previous surveys (Platte and Butler 1992) indicated relatively high scoter densities (Fig. 1). While the 58 transects within the core survey area represent the annual monitoring effort, additional lower quality habitat abounds throughout the Yukon Flats. In an effort to quantify the value of this lower quality habitat, supplementary transects were added to the annual survey. A complete survey of the supplementary transects is scheduled to be completed within

three to four years. In 2002, nine supplementary transects (Fig. 1) were completed with plans to conduct more in future years.

Transects were 400 meters wide resulting in 678.4 km^2 of sample area for the primary transects and 212.8 km^2 of additional area for the supplementary transects. The survey was flown in a Cessna 206 aircraft at 100-150 feet above ground level and at 90-105 mph. Aircraft navigation and altitude were maintained with a Global Positioning System (GPS) and radar altimeter, respectively. Scoters and scaup were the only waterfowl recorded during the survey, and a circling maneuver was used to positively identify scoters to species when necessary.

The survey was temporally designed to occur when the highest number of indicated-breeding white-winged scoters were present in the survey area. Previous replicate scoter surveys of the Yukon Flats (Mallek 2001, Mallek 2002[b]) indicated that the end of the first week through the second week of June was the most appropriate time to monitor white-winged scoters.

Survey Procedures

Observations were recorded directly into laptop computers as sound files using a program developed by John Hodges (USFWS, Region 7, Waterfowl Management - Juneau). Each laptop computer (one for each observer) was linked to the aircraft GPS unit. The program simultaneously recorded observations and their coordinates into linked sound and ASCII files, respectively. A second computer program, also developed by John Hodges, was used on the ground to replay the linked sound files and produce transcribed ASCII files. The transcribed ASCII files were then used for data analyses.

Observations of scoters and scaup were recorded according to breeding pair survey protocol (U.S. Fish and Wildlife Service and Canadian Wildlife Service 1987). All observations of lone male scoters or scaup (drakes) were recorded as singles. Drakes in flocks were recorded as flocked drakes. A male scoter or scaup in close association with a female of the same species was recorded as a pair. Scoters or scaup in mixed-sex groupings of three or more of the same species which could not be separated into singles and pairs were recorded as groups (a hen and two drakes were recorded as a pair and a single). Females not accompanied by drakes were not counted.

Statistical Methods

Following standard waterfowl breeding population survey data protocol (U. S. Fish and Wildlife Service and Canadian Wildlife Service 1987, Smith 1995), all observations of lone scoter drakes, flocked scoter drakes (<5), and pairs were doubled for analyses. Observations of lone scaup drakes, and flocked scaup drakes were not doubled for analyses. Groups of scoters and scaup were not doubled.

Population indices and variance estimates were calculated using standard statistical procedures for stratified analyses as described by Smith (1995). Visibility correction factors were not incorporated in the population indices.

RESULTS

The survey was conducted over a four day period from 9-12 June 2002. Within the primary (annual) survey area, white-winged scoters accounted for 99% of the indicated-total ((singles + pairs + flocked drakes) * 2 + groups) scoters observed during the survey, while surf scoters (*Melanitta perspicillata*) accounted for 1%. No black scoters (*Melanitta nigra*) were observed during the survey. For the primary survey area, Table 1 lists the number of scoters observed as singles, pairs, flocked drakes, and groups, as well as the indicated-breeding ((singles + pairs + flocked drakes) * 2), indicated-total, and expanded population indices. The population indices (uncorrected for visibility bias) for white-winged and surf scoters in the primary survey area were 16,951 and 165, respectively. The lesser scaup population index within the primary survey area was 23,745.

The supplementary transects represent a small fraction of the lower quality habitat, thus several years of data are necessary to make a realistic comparison of the primary survey area (supposed high quality habitat) to the supplementary survey data (supposed low quality habitat). Therefore, only observational data of scoters and scaup from the supplementary transects are provided in Table 1. Observations and indicies from the 2001 monitoring survey (Mallek 2002[a]) are provided in Appendix 1.

The first aerial survey to monitor scoter populations on the Yukon Flats, Alaska was initiated in 2001 (Mallek 2002[b]), therefore, only one previous estimate is available for direct comparison. Furthermore, comparisons with other surveys conducted on the Yukon Flats are problematic due to the high spatial and temporal variability exhibited by scoters (Mallek 2001, Mallek 2002[b], Mallek 2003). Comparison of white-winged scoter observations and indicies from 2001 and 2002 reveal similar results. The 2002 survey index was approximately 3% greater than the 2001 index for white-winged scoters. For surf scoters, significantly fewer birds were observed in 2002 (-84%) compared to the 2001 survey. Since 2002 was the first year lesser scaup were recorded on this survey, no comparisons can be made to previous estimates.

DISCUSSION

The timing of the 2002 survey (9-12 June) was based on data from replicate aerial scoter surveys conducted in 2000 and 2001 (Mallek 2001, Mallek 2002[b]) and on nest initiation data reported by Lensink (1965). An attempt was made to survey during the peak occurrence of indicated-breeding white-winged scoters, some time in the second week of June. Although survey timing was based on the peak occurrence estimate from 2000 and 2001, survey timing may have been late by several days since the peak occurrence of indicated-breeding white-winged scoters on the Yukon Flats in 2002 was estimated at June 8 (Mallek 2003). The replicate scoter timing surveys conducted in 2000, 2001, and 2002 suggest that the 2003 scoter and scaup monitoring survey should be conducted late in the first week to early in the second week of June.

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Data and conclusions presented here are preliminary and are not for publication or citation in published manuscripts without permission from the author.

REFERENCES CITED

Bellrose, F. C. 1980. Ducks, geese and swans of North America. Stackpole Books, Harrison, PA

Conant, B., and F. Roetker. 1987. Alaska-Yukon waterfowl breeding population survey: May 14 to June 14, 1987. Unpubl. Rept., U. S. Fish and Wildl. Serv., Juneau, AK. 25pp.

_____, and C. P. Dau. 1990. Alaska-Yukon waterfowl breeding population survey: May 18 to June13, 1990. Unpubl. Rept., U. S. Fish and Wildl. Serv., Juneau, AK. 26pp.

_____, and D. J. Groves.1992. Alaska-Yukon waterfowl breeding population survey: May 24 to June 21, 1992. Unpubl. Rept., U. S. Fish and Wildl. Serv., Juneau, AK. 26pp.

_____, B., D. J. Groves. 2001. Alaska-Yukon waterfowl breeding population survey: May 15 to June 12, 2000. Unpubl. Rept., U. S. Fish and Wildl. Serv., Juneau, AK. 32pp.

King, J. G., C. J. Lensink. 1971. An evaluation of Alaska habitat for migratory birds. Unpubl. Rept., U. S. Fish and Wildl. Serv., Washington DC.

Lensink, C. J. 1965. Waterfowl of the Yukon Flats, Alaska. Unpubl. Rept., U. S. Fish and Wildl. Serv. 129pp.

Mallek, E. J. 2001. Replicate aerial scoter surveys of the Yukon Flats, Alaska - 2000. Unpubl. Rept., U. S. Fish and Wildl. Serv., Fairbanks, AK 14pp.

Mallek, E. J. 2002[a]. Aerial scoter monitoring survey of the Yukon Flats, Alaska - 2001. Unpubl. Rept., U. S. Fish and Wildl. Serv., Fairbanks, AK 7pp.

Mallek, E. J. 2002[b]. Replicate aerial scoter surveys of the Yukon Flats, Alaska - 2001. Unpubl. Rept., U. S. Fish and Wildl. Serv., Fairbanks, AK 14pp.

Mallek, E. J. 2003. Replicate aerial scoter surveys of the Yukon Flats, Alaska - 2002 Final Report. Unpubl. Rept., U. S. Fish and Wildl. Serv., Fairbanks, AK 22pp.

Platte, R. M., and W. I. Butler Jr. 1992. Aerial surveys and mapping of waterbird distribution and abundance for impact assessment of potential oil development on the Yukon Flats National Wildlife Refuge, Alaska. Unpubl. Rept., U. S. Fish and Wildl. Serv., Anchorage AK 122pp.

Smith, G. W. 1995. A critical review of the aerial and ground surveys of breeding waterfowl in North America. Biological Science Report 5, National Biological Service, Washington D.C. 252pp.

U. S. Fish and Wildl. Serv. - Canadian Wildl. Serv. 1987. Standard operating procedures for aerial waterfowl breeding ground population and habitat surveys in North America. Unpubl. Manual.

U. S. Fish and Wildl. Serv. 1999. Population status and trends of sea ducks in Alaska. Unpubl. Rept. Anchorage, AK 137pp.

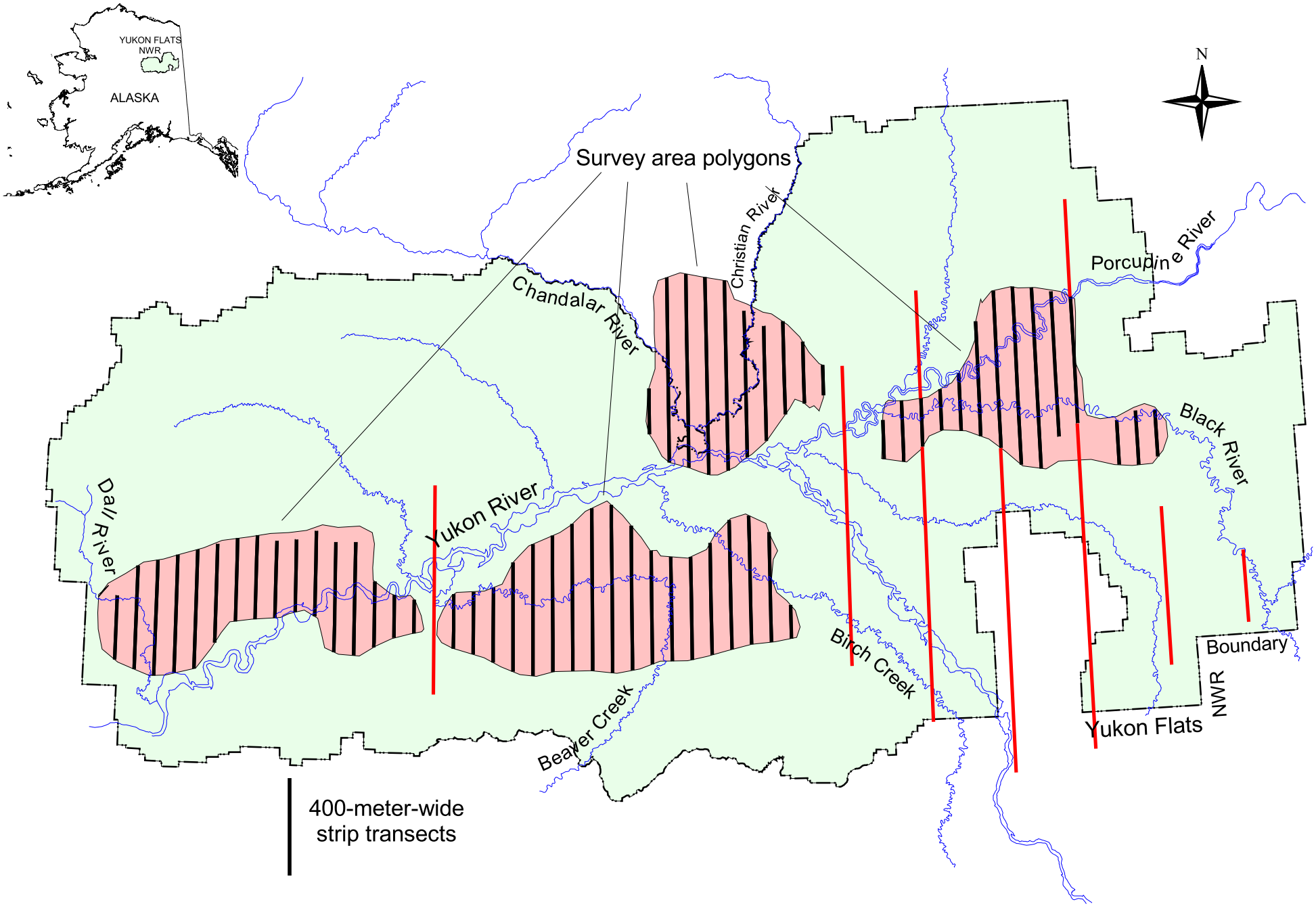

Fig. 1. Map features of the Yukon Flats , Alaska in relation to the primary trasect locations (black) and supplementary transect locations (red) of the scoter and scaup monitoring survey - 2002.

Table1. Species composition and group classification of scoters and scaup by stratum from the primary survey area (west, south central, north central and east strata) and the supplementary survey area on the Yukon Flats, Alaska 9-12 June 2002.

Species	Stratum	Singles	Flocked drakes	Pairs	Groups	Indicated-breeding	Indicated-total	Sample Area km^2 (n)
WWSC	west	24	18	73	5	230	235	157.8 (16)
	south central	63	45	135	5	486	491	268.1 (18)
	north central	19	16	55	36	180	216	105.3 (10)
	east	21	22	75	0	236	236	147.3 (14)
WWSC Total		127	101	338	46	1,132	1,178	
WWSC	Index =	16,951	SE =	2,106				
SUSC	west	0	0	1	0	2	2	157.8 (16)
	south central	2	0	2	0	8	8	268.1 (18)
	north central	0	0	1	0	2	2	105.3 (10)
	east	0	0	0	0	0	0	147.3 (14)
SUSC Total		2	0	4	0	12	12	
SUSC	Index =	165	SE =	89				
SCAU	west	52	47	171	70	441	511	157.8 (16)
	south central	54	66	145	112	410	522	268.1 (18)
	north central	35	45	67	5	214	219	105.3 (10)
	east	42	74	102	67	320	387	147.3 (14)
SCAU Total		183	232	485	254	1,385	1,639	
SCAU	Index =	23,745	SE =	2,348				
WWSC	supplementary	15	26	32	0	146	146	212.8 (9)
SUSC	supplementary	0	0	0	0	0	0	212.8 (9)
SCAU	supplementary	12	27	39	20	117	137	212.8 (9)

WWSC=white-winged scoter, SUSC=surf scoter, SCAU=scaup, no black scoters were observed during the survey.
Stratum Area (km^2): west = 2,388.7, south central = 3,217.3, north central = 1,989.8, east = 2,132.4.

Appendix 1. Species composition and group classification of scoters by stratum from an aerial monitoring survey conducted on the Yukon Flats, Alaska 11-14 June 2001.

Species	Stratum	Singles	Flocked drakes	Pairs	Groups	Indicated-breeding	Indicated-total	Index	SE
WWSC	west	22	3	87	77	224	301		
	south central	32	26	132	55	380	435		
	north central	11	16	53	8	160	168		
	east	15	10	78	33	206	239		
WWSC Total		80	55	350	173	970	1143	16,432	1,978
SUSC	west	1	0	2	0	6	6		
	south central	4	3	7	5	28	33		
	north central	3	2	2	0	14	14		
	east	2	0	8	0	20	20		
SUSC Total		10	5	19	5	68	73	1,036	297
BLSC	west	0	0	0	0	0	0		
	south central	0	0	0	0	0	0		
	north central	0	0	0	0	0	0		
	east	0	4	1	0	10	10		
BLSC Total		0	4	1	0	10	10	145	193

Strata areas and sample area per stratum are reported in Table 1.
Table corrected on 10 April 2003